

Renovation/ Closure of Waste Impoundments

Alabama Guide Sheet No. AL360



DEFINITION

The process of removing the long-term accumulation of sludge, floating matter, and wastewater from waste impoundments (animal waste lagoons or storage ponds) in an environmentally safe manner.

GENERAL INFORMATION

Waste impoundments (lagoons and storage ponds) for animal feeding operations often need renovation to restore design volumes and/or waste treatment function. If an animal feeding operation closes, the waste impoundment will also need to be properly closed or converted to a different use.

All activities involved with closure of a waste impoundment will be certified by a qualified credentialed professional (QCP).

The renovation/closure of waste impoundments includes, but is not limited to:

- agitating and pumping the mixed contents of the waste impoundment to the land as fertilizer with either irrigation equipment or liquid manure spreaders
- dredging, stockpiling, draining, controlling seepage or runoff, and spreading the dried sludge material as fertilizer
- preparing the impoundment site for the intended future use

All waste products removed from the waste impoundment during renovation/closure should be managed to prevent seepage/runoff and land applied with adequate buffers according to [Alabama NRCS conservation practice standard Nutrient Management, Code 590](#).

Renovation of Waste Impoundments

Agitation and Pumping

Agitation of the contents of a waste impoundment involves utilizing specially designed equipment to thoroughly mix the solid and liquid wastes together into a slurry. Agitation must begin long before the pumping begins and must continue during pump out. Large waste impoundments may require more than one agitator or agitation at multiple locations to effectively mix the solid and liquid wastes.

The agitated mixture is most often pumped through specially designed irrigation equipment to deliver the slurry to the land application area according to the nutrient management plan. The mixed contents of some small waste impoundments may be pumped into liquid manure spreaders for application in the fields.

Dredging

There may be a layer of solid sludge remaining that cannot be removed by agitation. This may require earth moving equipment operating inside the impoundment to move this solid layer from the sides and bottom to the dredging equipment. Extreme care must be taken to avoid damaging the structure liner during this part of the operation.

If this solid sludge is too wet for immediate land application, it must be stockpiled near the waste impoundment to dry. Seepage and rainfall runoff from the sludge must be controlled so that pollution of surface or groundwater does not occur. This may require installing a compacted clay pad or liner, sump pump, grass filter, and/or routing drainage back into the impoundment. After the sludge has dried, the material may be land applied.

After completion of agitation, pumping, and dredging, the waste impoundment should be considered renovated if the original design volumes and/or waste treatment function is restored. The waste impoundment may need

to be enlarged prior to reuse if the livestock operation has increased in size since the original design or if necessary to provide for effective odor control and minimum storage requirements required by state regulations. The liner may require evaluation and testing to document that it has a sufficiently low permeability rate. Lagoons that are renovated should be filled with fresh water to 60% of the minimum treatment volume before new wastes are introduced to the system.

Closure of Waste Impoundments

Waste impoundments scheduled for closure can be either eliminated with earthfill or converted to fresh water use.

Elimination with Earth Fill

Waste impoundments scheduled for elimination should first have as much waste as practical properly removed and land applied. The process of agitation and pumping should remove most of the waste impoundment contents. However, there may be a layer of nutrient rich sludge left on the sides and bottom of the waste impoundment. If a solid sludge layer remains, it should be removed as described in the section on "Dredging". Only the sludge needs to be scraped and removed. Firm soil that is only stained by the wastes need not be removed.

In the event that sufficient land is not available for sludge disposal in close proximity to the waste impoundment, the excess sludge may be left in place and covered with suitable material provided all of the following conditions will be met:

- measures are taken to remove as much of the sludge as practical that can be properly land applied
- the remaining sludge layer is no more than 1 foot thick
- the liner under the sludge can be certified by a QCP to have a specific discharge of 0.028 ft. per day or less, or to have been installed according to NRCS specifications at the time of construction
- the finished surface will be mounded to provide positive surface drainage
- the final compacted layer on the finished surface will be constructed of clayey material and have a compacted thickness of at least 12 inches
- at least 4 in. of topsoil will be added to the surface to facilitate vegetation establishment
- any rainfall runoff will be diverted from the closure area

Earthfill should be added in 9 in. uncompacted lifts, and each lift compacted with at least 2 passes of the earthmoving equipment. The earthfill process should

continue until the area is overfilled at least 5 percent and mounded so that rainfall does not accumulate.

Protection.

All disturbed areas not returned to crop production shall be vegetated in accordance with [Alabama NRCS conservation practice standard Critical Area Planting, Code 342](#), or other suitable measures used to control erosion and restore the esthetic value of the site.

Measures shall be taken during closure to minimize erosion and pollution of downstream water resources. This may include such items as silt fences, hay bale barriers, temporary vegetation, mulching, etc.

Conversion to Fresh Water Use

Waste impoundments scheduled for conversion to fresh water use should first have the wastes, both liquid and solid, totally removed and properly land applied. If a solid sludge layer remains after agitation and pumping, it should be removed as described in the section on "Dredging" until a firm soil surface remains. Stained firm soil need not be removed. A QCP can determine if the converted waste impoundment needs pipes and an auxiliary spillway installed to properly convert the impoundment into a farm pond.

A depth to contain the 25-year/24-hour storm volume, or a minimum of 1 foot, shall be maintained between the maximum water surface and the overflow elevation during the conversion process. The pond shall not be allowed to discharge until certified for fresh water use, as described below, by a QCP.

The impoundment may be refilled with fresh water and the dissolved oxygen (DO) monitored through one warm weather growing season (March - October) to determine if at least 3 mg/l of DO can be continually maintained without artificial or mechanical aeration. If so, the impoundment can be considered suitable for fresh water use. If not, the impoundment shall be treated or the contents shall be land applied and the impoundment refilled as many times as needed until the water quality will provide 3 mg/l of DO throughout a warm weather growing season without artificial or mechanical aeration. Fish may be introduced into the pond during this monitoring stage; however, some means of aeration should be available in case the DO level falls below 3 mg/l.

DO shall be measured with test equipment with an accuracy of 0.2 mg/l or less, and water quality monitoring shall be performed as follows:

- measure water temperature at least weekly
- obtain DO sample at least one foot below the water surface
- follow manufacturer's instructions for using test equipment for determining DO

- sample DO at least monthly when the water temperature is less than 50° F
- sample DO at least every two weeks when the water temperature is 50° F to 70° F
- sample DO at least weekly when the water temperature exceeds 70° F
- sample DO immediately prior to daybreak to obtain the typical lowest level of the day
- 5-day biochemical oxygen demand (BOD₅) may be required as needed to verify the quality of pond discharges

The monitoring process and the results shall be certified by a QCP.

REFERENCES

ADEM Administrative Code, Chapter 335-6-7, as amended

[ADEM/NRCS Buffer Distance Summary for Animal Feeding Operations](#)

Alabama NRCS Conservation Practice Standards:

[Critical Area Treatment, Code 342](#)

[Closure of Waste Impoundments, Code 360](#)

[Manure Transfer, Code 634](#)

[Nutrient Management, Code 590](#)

[Pond, Code 378](#)

Alabama NRCS Guide Sheets

[Application Distances for Applying Animal Manure and Organic By-Products, AL 590](#)

[Wastewater Irrigation, AL 634](#)

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